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10/813,131	03/31/2004	Xiuzhang James Zhang	839-1546	3717
36/024 7590 06/08/2009 NIXON & VANDERHYE P.C. 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER VERDIER, CHRISTOPHER M				
ART UNIT 3745		PAPER NUMBER		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
10813131	3/31/2004	ZHANG ET AL.	839-1546

## EXAMINER

Christopher Verdier

ART UNIT	PAPER
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3745

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## Commissioner for Patents

The following replaces the Grounds of Rejection section in the Examiner's Answer mailed September 13, 2007 pursuant to the Order Returning Undocketed Appeal to the Examiner mailed May 20, 2009:

## (9) Grounds of Rejection:

The following ground(s) of rejection are applicable to the appealed claims:

## Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action: (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-2, 4-6, 7, and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta 5,771,577 in view of Kercher 3,542,486. Gupta (figures 3A and 3B) discloses a turbine component 10 substantially as claimed, with the turbine component 10 having a plurality of film-cooling holes 12 formed in a region of the component to be cooled, the cooling holes having a specified diameter 14, each hole at an exit thereof formed with a counter-bore 18 of predetermined depth, the component having a coating 22 applied thereto at least in the region, wherein the counter-bore provides an area for excess coating material to accumulate without reducing the specified diameter. The specified diameter is in the range of about 0.01 to 0.04 inch, and the counter-bore diameter is about 0.02 to 0.10 inch. The coating comprises a first bondcoat layer and a second thermal barrier coating layer, with the bondcoat layer being Ni-Al based material and the thermal barrier coating being yttria stabilized zirconium material. Also disclosed is a method of maintaining cooling efficiency of the film-cooling holes in the turbine component, where the film-cooling holes have specified diameters 14 and the turbine component has the protective coating thereon, comprising a) before coating, forming each film-cooling hole with the counter-bore at an exit end of the film-cooling hole; and b) spraying the coating onto the turbine component at

least in areas surrounding the film-cooling holes such that excess coating material accumulates in the counter-bore without reducing the specified diameters of the cooling holes. See column 2, lines 11-25, column 4, lines 60-67, column 5, lines 1-7, column 5, lines 18-39, and column 6, lines 1-7.

However, Gupta does not disclose that each hole at the exit end is formed with a concentric counter-bore, each hole and respective counter-bore being parallel and connected by a substantially 90 degree shoulder (claims 1, 10 and 13). Gupta also does not disclose that the gas turbine bucket has a shank portion (claim 10).

Kercher (figures 2-3 and 5) shows a cooled turbine blade/bucket 24 having film cooling holes 62 formed such that each hole at the exit end is formed with a concentric counter-bore 64, each hole and respective counter-bore being parallel and connected by a substantially 90 degree shoulder (column 3, lines 59-72), for the purpose of providing a diffusion section effective to reduce the efflux velocity of cooling fluid to a desired level. Kercher also shows that the gas turbine bucket has a shank portion 44, for the purpose of securing the bucket to a rotor.

Column 6, lines 2-15 of Gupta teaches that the counter-bore 18 may be of various shapes and need not be circular, so long as the relationships of the invention of Gupta are maintained. In view of this statement, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the film cooling holes 12 of Gupta in figures 3A or 3b such that each hole at the exit end is formed with a concentric counter-bore, each hole and respective counter-bore being parallel and connected by a substantially 90 degree shoulder, as taught by Kercher, for the purpose of providing a diffusion section effective to reduce the efflux velocity of cooling fluid to a desired level. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the turbine blade/bucket of Gupta such that it has a shank portion, as taught by Kercher, for the purpose of securing the bucket to a rotor.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta 5,771,577 and Kercher 3,542,486 as applied to claim 2 above, and further in view of Fric 6,383,602. The modified turbine component of Gupta shows all of the claimed subject matter except for the counter-bore depth being about 0.030 inch.

Fric (figures 5-8 and column 5, lines 35-48) teaches that film-cooled turbine components 40 may have cooling passages 46 with a counter-bore 51, 56 at the exit of the passages having a depth of about 0.030 inch, for the purpose of providing increased cooling effectiveness.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the depth of the counter-bore in the modified turbine component of Gupta such that it is about 0.030 inches, as taught by Fric, for the purpose of providing increased cooling effectiveness.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta 5,771,577 and Kercher 3,542,486 as applied to claim 7 above, and further in view of Fric 6,383,602. The modified turbine component/gas turbine bucket of Gupta shows all of the claimed subject matter, except for the counter-bore depth being about 0.030 inch.

Fric (figures 5-8 and column 5, lines 35-48) teaches that film-cooled turbine components 40 may have cooling passages 46 with a counter-bore 51, 56 at the exit of the passages having a depth of about 0.030 inch, for the purpose of providing increased cooling effectiveness.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the depth of the counter-bore in the modified turbine component/gas turbine bucket of Gupta such that it is about 0.030 inches, as taught by Fric, for the purpose of providing increased cooling effectiveness.

No changes to the Examiner's Answer have been made and no new period for reply is given.

/Christopher Verdier/  
Primary Examiner, Art Unit 3745